

IN THE CLAIMS:

The pending claims are set forth below and have been amended and/or cancelled, without prejudice, where noted:

1. (Currently Amended) A olefin polymerization catalyst characterized by the formula



wherein:

a. Flu is a fluorenyl group substituted at at least one both of the 4,5 positions by a bulky hydrocarbyl group containing a cyclic compound having from 3 to 30 carbon atoms;

b. A is a substituted or an unsubstituted cyclopentadienyl group, a substituted or unsubstituted indenyl group, or a heteroorgano group XR in which X is a heteroatom from Group 15 or 16 of the Periodic Table, and R is an alkyl group, a cycloalkyl group or an aryl group containing from 1 to 20 carbon atoms;

c. B is a structural bridge between A and Flu imparting stereorigidity to the ligand structure (FluA);

d. M is a Group 4 or Group 5 transition metal;

e. Q is selected from the group consisting of Cl, Br, I, an alkyl group, an amino group, an aromatic group and mixtures thereof; and

f. n is 1 or 2.

2. (Cancelled) The catalyst composition of claim 1 wherein Flu is substituted at both of the 4 and 5 positions with a bulky hydrocarbyl group containing a cyclic compound having from 3 to 30 carbon atoms.

3. (Cancelled) The catalyst composition of claim 1 wherein Flu is mono-substituted at the 4 or 5 position and is otherwise unsubstituted.

4. (Cancelled) The catalyst composition of claim 1 wherein Flu is mono-substituted at the 4 or 5 position and is di-substituted at the 2,7 positions with alkyl groups, phenyl or substituted phenyl groups, which may be the same or different.

5. (Cancelled) The catalyst composition of claim 4 wherein the fluorenyl group Flu is di-substituted at the 2,7 positions with substituents of a lower molecular weight than the substituent at the 4 or 5 position.

6. (Cancelled) The catalyst composition of claim 4 wherein the fluorenyl group Flu is di-substituted at the 3,6 position with alkyl groups of a lower molecular weight than the substituent at the 4 or 5 position.

7. (Original) The catalyst composition of claim 1 wherein A is a heteroorgano group XR and X is N, P, O or S.

8. (Cancelled) The composition of claim 6 wherein 7 is N and R is a mononuclear aromatic group or an alkyl group or cycloalkyl group containing from 1 - 20 carbon atoms.

9. (Original) The composition of claim 1 wherein said structural bridge B is characterized by the formula ERR" wherein E is C, Si or Ge and R' and R" are each independently an alky group, an aromatic group or a cycloalkyl group.

10. (Original) The composition of claim 1 wherein A is a substituted or unsubstituted cyclopentadienyl group.

11. (Original) The composition of claim 10 wherein M is titanium, zirconium or hafnium.

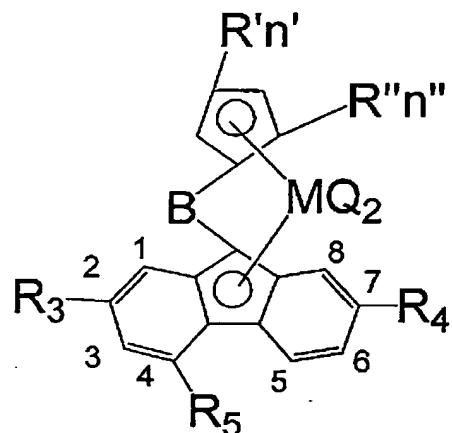
12. (Original) The composition of claim 11 wherein Flu is substituted at one of the 4 or 5 positions with a phenyl group which is substituted or unsubstituted.

13. (Original) The composition of claim 12 wherein A is cyclopentadienyl group substituted at the 3 position with a tertiary butyl group.

14. (Original) The composition of claim 13 wherein said cyclopentadienyl group is substituted at the 5 position with a methyl group.

15. (Original) The composition of claim 13 wherein said fluorenyl group is disubstituted at the 2,7 positions with isopropyl or tertiary butyl groups.

16. (Withdrawn) An olefin polymerization catalyst characterized by the formula



wherein:

- R' is a C₁ – C₄ alkyl group or an aryl group;
- R'' is a methyl group or an ethyl group;
- n' is 0 or 1;
- n'' is 0 or 1;
- B is a structural bridge between the fluorenyl and cyclopentadienyl groups;
- M is titanium, zirconium or hafnium;
- Q is selected from the group consisting of Cl, Br, I, an alkyl group, an amino group, an aromatic group and mixtures thereof;
- R₃ and R₄ are the same or different and are each a hydrogen or an isopropyl group or a tertiary butyl group, or phenyl, or substituted phenyl group; and
- R₅ is an alkyl or aromatic group which has a higher molecular weight than R₃ or R₄.

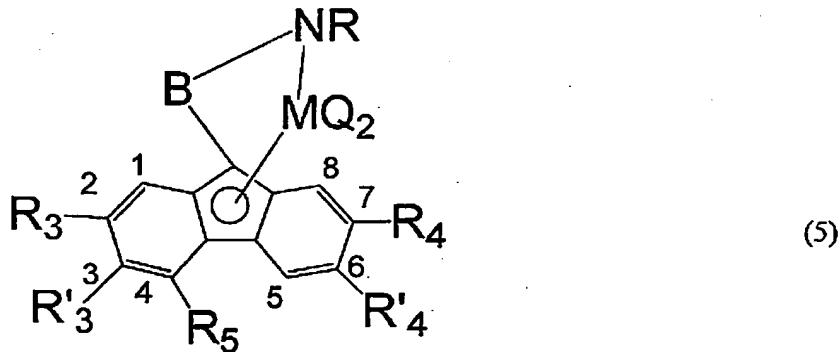
17. (Withdrawn) The catalyst of claim 16 wherein R' is a tertiary butyl group and n' is 1, R₃ and R₄ are each tertiary butyl groups and R₅ is a substituted or unsubstituted phenyl group.

18. (Withdrawn) The catalyst composition of claim 17 wherein n" is 1.

19. (Withdrawn) The catalyst of claim 18 wherein R" is a methyl group.

20. (Withdrawn) The composition of claim 17 wherein R₅ is a 4-tertiary butyl phenyl group.

21. (Withdrawn) An olefin polymerization catalyst characterized by the formula



wherein:

- a. R is a mononuclear aromatic group, or an alkyl group or cycloalkyl group containing from 1 - 20 carbon atoms;
- b. B is a structural bridge between the fluorenyl group and the heteroatom group NR;
- c. M is titanium, zirconium or hafnium;
- d. Q is selected from the group consisting of Cl, Br, I, an alkyl group, an amino group, an aromatic group and mixtures thereof;
- e. R₃ and R₄ are the same or different and are each a hydrogen or a C₁ - C₄ alkyl group, or phenyl, or substituted phenyl group;
- f. R'₃ and R'₄ are each hydrogen or a C₁ - C₄ alkyl group providing that when R₃ and R₄ are hydrogen, R'₃ and R'₄ are hydrogen; and

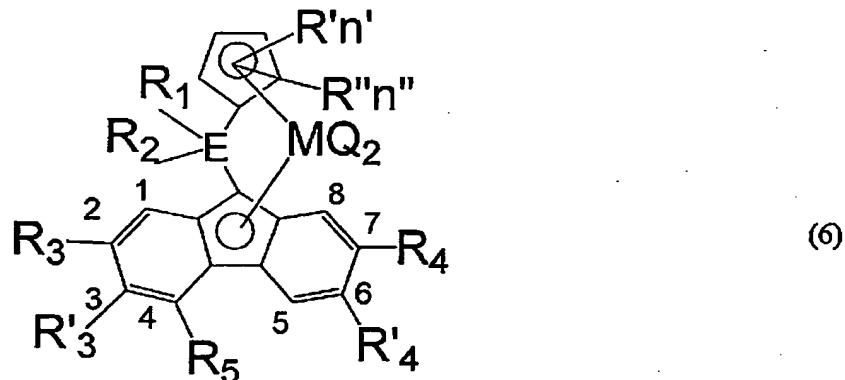
g. R_5 is an alkyl or aromatic group which has a higher molecular weight than R_3 or R_4 .

22. (Withdrawn) The catalyst of claim 21 wherein R_3 and R_4 are each a tertiary butyl group, R'_3 and R'_4 are each a $C_1 - C_4$ alkyl group and R_5 is a substituted or unsubstituted phenyl group.

23. (Withdrawn) The composition of claim 22 wherein R is tertiary butyl group.

24. (Withdrawn) The catalyst of claim 21 wherein R_3 and R_4 are each hydrogen and R_5 is a tertiary butyl group, a phenyl group, or a substituted phenyl group.

25. (Withdrawn) An olefin polymerization catalyst characterized by the formula



wherein:

- R' is a $C_1 - C_4$ alkyl group or an aryl group;
- n' is from 0 to 3;
- R'' is an alkyl group of a lower molecular weight than R' ;
- n'' is 0 or 1;
- E is $-C-$ or $-Si-$;
- R_1 and R_2 are the same or different and are each a methyl group, a phenyl group or a substituted phenyl group;
- M is titanium, zirconium or hafnium;
- Q is a chlorine, a methyl group or a phenyl group;

- i. R_3 and R_4 are the same or different and are each a hydrogen or a C₁ – C₄ alkyl group, or phenyl, or substituted phenyl group;
- j. R'_3 and R'_4 are each hydrogen or a C₁ – C₄ alkyl group provided that when R_3 and R_4 are hydrogen, R'_3 and R'_4 are hydrogen; and
- k. R_5 is an alkyl group or aromatic group which has a higher molecular weight than R_3 or R_4 .

26. (Withdrawn) The catalyst of claim 25 wherein n' and n" are 0, R_3 and R_4 are each hydrogen, and R_5 is a tertiary butyl group or a substituted or unsubstituted phenyl group.

27. (Withdrawn) The catalyst of claim 25 wherein R_3 and R_4 are each independently a C₁ – C₄ alkyl group and R_5 is a substituted or unsubstituted phenyl group.

28. (Withdrawn) The catalyst composition of claim 25 wherein R_3 and R_4 are tertiary butyl groups, R_5 is a substituted or unsubstituted phenyl group and n' and n" are each 0.

29. (Withdrawn) The catalyst composition of claim 25 wherein n' is 1 and R' is a tertiary butyl group substituted on said cyclopentadienyl group at the 3 position.

30. (Withdrawn) The catalyst composition of claim 29 wherein R_3 and R_4 are tertiary butyl groups and R_5 is a phenyl group or a 4-tertiary butyl phenyl group.

31. (Withdrawn) The catalyst composition of claim 29 wherein n" is 1 and R" is a methyl group substituted on said cyclopentadienyl group at the 5 position.

32. (Withdrawn) A process for the polymerization of an ethylenically unsaturated monomer comprising:

- a. providing a transition metal catalyst characterized by the formula

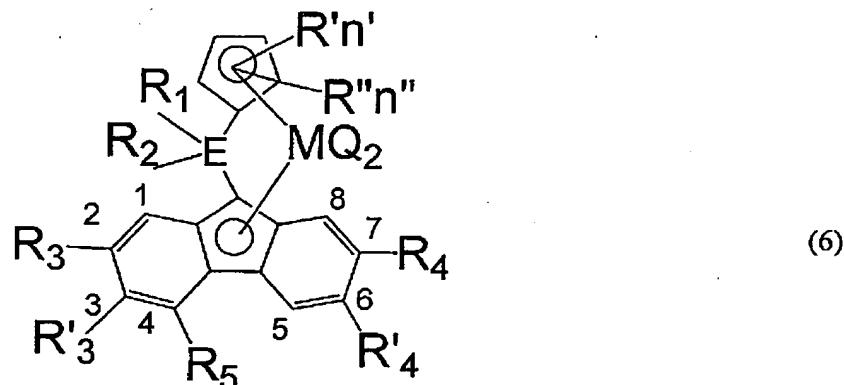


wherein:

- i. Flu is a fluorenyl group substituted at at least one of the 4,5 positions by a bulky hydrocarbyl group containing at least four carbon atoms;
 - ii. A is a substituted or an unsubstituted cyclopentadienyl group, a substituted or unsubstituted indenyl group, or a heteroorgano group XR in which X is a heteroatom from Group 15 or 16 of the Periodic Table, and R is an alkyl group, a cycloalkyl group or an aryl group containing from 1 to 20 carbon atoms;
 - iii. B is a structural bridge between A and Flu, imparting stereorrigidity to the ligand structure (FLA);
 - iv. M is a Group 4 or Group 5 transition metal;
 - v. Q is selected from the group consisting of Cl, Br, I, an alkyl group, an aromatic group and mixtures thereof; and
 - vi. n is 1 or 2;
- b. providing an activating cocatalyst component;
 - c. contacting said catalyst component and said cocatalyst component in a polymerization reaction zone with an ethylenically unsaturated monomer under polymerization conditions to produce a polymer product by polymerization of said monomer; and
 - d. recovering said polymer product from said reaction zone.

33. (Withdrawn) The process of claim 32 wherein said monomer comprises propylene and said polymer product is a polypropylene homopolymer or copolymer.

34. (Withdrawn) The process of claim 33 wherein said transition metal catalyst is characterized by the formula



wherein:

- a. R' is a C₁ – C₄ alkyl group or an aryl group;
- b. n' is from 0 to 3;
- c. R'' is an alkyl group of a lower molecular weight than R';
- d. n'' is 0 or 1;
- e. E is –C– or –Si–;
- f. R₁ and R₂ are the same or different and are each a methyl group, a phenyl group or a substituted phenyl group;
- g. M is titanium, zirconium or hafnium;
- h. Q is a chlorine, a methyl group or a phenyl group;
- i. R₃ and R₄ are the same or different and are each a hydrogen or a C₁ – C₄ alkyl group or phenyl, or substituted phenyl group;
- j. R'₃ and R'₄ are each hydrogen or a C₁ – C₄ alkyl group provided that when R₃ and R₄ are hydrogen, R'₃ and R'₄ are hydrogen;
- k. R₅ is an alkyl group or aromatic group which has a higher molecular weight than R₃ or R₄;
- l. and said polymer product is an isotactic polypropylene.

35. (Withdrawn) The process of claim 33 wherein n' is 1 and R' is a tertiary butyl group substituted on said cyclopentadienyl group at the 3 position.

36. (Withdrawn) The process of claim 34 wherein R₃ and R₄ are tertiary butyl groups and R₅ is a phenyl group or a 4-tertiary butyl phenyl group.

37. (Withdrawn) The process of claim 35 wherein n" is 1 and R" is a methyl group substituted on said cyclopentadienyl group at the 5 position.

38. (Withdrawn) The catalyst of claim 1 wherein the bulky hydrocarbyl group is an aromatic group.

39. (Withdrawn) The catalyst of claim 1 wherein the bulky hydrocarbyl group is a multi-ring aromatic group.

40. (Withdrawn) The catalyst of claim 1 wherein the bulky hydrocarbyl group is a contiguous multi-ring aromatic group.